Coffee Break Training - Fire Protection Series

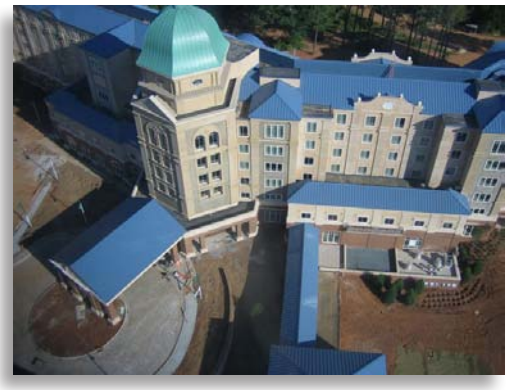
Building Construction: Fire-retardant Roof Coverings

No. FP-2013-33 August 13, 2013

Learning Objective: *The student shall be able to describe three criteria of roof-covering fire tests.*

The interpretation and application of the model building codes for roofing fire performance is complicated by subtle differences in code language and testing criteria.

A **roof assembly** is all of the components above the roof's structural frame (think of it as the "skeleton") and includes the roof deck, vapor barrier, insulation or thermal barrier, roof covering, coatings or toppings, or any combination of these components. A **roof covering**, on the other hand, is the outer membrane that covers the roof deck for weather, fire or impact resistance. One might imagine it as the "skin" that covers the outside of the roof.



This metal roof covering may achieve a Class A, B or C fire resistance rating depending upon how the structure beneath is protected from fire. *Photo courtesy of Wayne Powell.*

Given the wide variety of climates under which buildings and roofs must be constructed to withstand the elements, it is no surprise that test standards vary.

One of these tests is American Society for Testing and Materials E108/Underwriters Laboratories 790/National Fire Protection Association 256, *Standard Methods of Fire Tests of Roof Coverings*. The test:

- Includes a simulated fire exposure to the roof covering's exterior surface, and, if needed, an evaluation of whether the roof covering's fire performance will be adversely affected by prolonged exposure to rain.
- Measures the surface flame spread and the roof-covering material or system's ability to resist fire penetration from the exterior to the underside of a roof deck under the exposure conditions.
- Provides criteria to evaluate if the roof-covering material will develop flying burning material **(brands)** when subjected to winds of 12 mph (5.3 meters per second) during the simulated fire exposure tests.

One important point to remember about the roof-covering tests is that they do not provide any basis for determining roof-covering fire resistance when exposed to a fire originating **inside** the building. Like all controlled tests, the results do not necessarily illustrate the expected performance of roof coverings under all actual fire conditions. They do provide results for comparing roof-covering materials under laboratory-controlled tests.

The tests provide three classes of results:

Class	Roof coverings that are effective against:
A	**Severe** test exposure and afford a high degree of fire protection to the roof deck. They do not slip from position and do not present a flying brand hazard.
B	**Moderate** test exposure and provide a moderate degree of fire protection to the roof deck. They do not slip from position and do not present a flying brand hazard.
C	**Light** test exposure and afford a light degree of fire protection to the roof deck. They do not slip from position and do not present a flying brand hazard.

Future Coffee Break Training items will explain additional test criteria. For information on National Fire Academy classes on building construction, please visit http://1.usa.gov/14XhC2i.